

REMARKS

Claims 14, 18 and 21 are pending. By this Amendment, Claims 15-17, 19, 20 and 22-27 are canceled, and Claims 14, 18 and 21 are amended. Reconsideration of the December 5, 2002, Official Action is respectfully requested.

As Claims 22-27 have been canceled, the restriction requirement is moot.

Claim 14 has been amended to incorporate the features of canceled dependent Claims 15 and 24. Claim 24 was directed to the gas formulation recited in Claim 15, i.e., to the elected invention, and accordingly Claim 24 should not have been withdrawn from consideration. Claim 14 is directed to the elected invention. As the subject matter recited in Claim 14 has previously been examined, the amendments to Claim 14 do not raise any new issue that would require further consideration and/or search, and thus should be entered.

Claim 17 was rejected under the 35 U.S.C. § 112, first paragraph, written description requirement. As Claim 17 has been canceled, this rejection is moot.

Claims 19 and 20 were rejected under 35 U.S.C. § 112, second paragraph. As Claims 19 and 20 have been canceled, this rejection is moot.

Claims 14-16 and 19 were rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,004,884 to Abraham. The reasons for the rejection are stated at numbered paragraph 6 of the Official Action. Claims 15, 16 and 19 have been canceled. The rejection of Claim 14 is respectfully traversed.

Claim 14, as amended, recites "an oxygen-free plasma etching gas formulation for removing an organic ARC on a metallic layer comprising CHF₃, argon and HCl or BCl₃."

the gas formulation being free of SF_6 . Abraham does not disclose the combination of features recited in Claim 14.

Abraham discloses using a $\text{Cl}_2/\text{Ar}/\text{CHF}_3$ first etch chemistry to etch a TiN ARC (col. 5, lines 58-59), and a second etch chemistry to etch the remaining layers of a wafer stack. The second etch chemistry can be any one of the group comprising Cl_2/BCl_3 , $\text{Cl}_2/\text{BCl}_3/\text{CHF}_3$, $\text{Cl}_2/\text{BCl}_3/\text{HCl}$, $\text{Cl}_2/\text{BCl}_3/\text{N}_2$ and Cl_2/N_2 (col. 7, lines 38-40). Abraham does not disclose a gas formulation comprising CHF_3 , argon and HCl or BCl_3 , as recited in Claim 14. Accordingly, Claim 14 is patentable over Abraham.

Withdrawal of the rejection of Claim 14 is therefore respectfully requested.

Claim 18 was rejected under 35 U.S.C. § 103(a) over Abraham in view of U.S. Patent No. 4,208,241 to Harshbarger et al. ("Harshbarger"). The reasons for the rejection are stated at numbered paragraph 8 of the Official Action. The rejection is respectfully traversed.

Claim 18 has been rewritten in independent form including the features of Claims 14 and 15, from which Claim 18 depended. Accordingly, the amendments to Claim 18 do not raise any new issue that would require further consideration and/or search, and thus should be entered.

The present Rule 53(b) Divisional Application was filed on February 15, 2002, and is entitled to the benefit of the filing date of the parent application, Application No. 09/002,007, which was filed on December 31, 1997 (now U.S. Patent No. 6,391,786). The present application is assigned to Lam Research Corporation ("Lam"). See the Assignment recorded at reel/frame: 9228/0642 in the U.S.P.T.O.

Abraham also is assigned to Lam. See the Assignment recorded at reel/frame:
7924/0815 in the U.S.P.T.O.

According to 35 U.S.C. § 103(c), and as explained at MPEP § 706.02(k)¹, because (1) the present application was filed after November 29, 1999, and (2) the present application and Abraham are commonly assigned to Lam, Abraham is disqualified as prior art under 35 U.S.C. § 102(e) against the present application. Therefore, the rejection of Claim 18 should be withdrawn.

Claim 21 was rejected under 35 U.S.C. § 103(a) over Abraham in view of U.S. Patent No. 5,565,036 to Westendorp et al. The reasons for the rejection are stated at numbered paragraph 9 of the Official Action. The rejection is respectfully traversed.

Claim 21 has been rewritten in independent form including the features of Claim 14, from which Claim 21 depended. Accordingly, the amendments to Claim 21 do not raise any new issue that would require further consideration and/or search, and thus should be entered.

As Abraham does not qualify as prior art under 35 U.S.C. § 102(e) against the present application, this rejection of Claim 21 also should be withdrawn.


¹"Effective November 29, 1999, subject matter which was prior art under former 35 U.S.C. 103 via 35 U.S.C. 102(e) is now disqualified as prior art against the claimed invention if that subject matter and the claimed invention 'were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.' This change to 35 U.S.C. 103(c) applies to all utility . . . applications filed on or after November 29, 1999, including continuing applications filed under 37 CFR 1.53(b)" (Emphasis added).

For the foregoing reasons, it is submitted that the application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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Marked-up Claims 14, 18 and 21

14. (Twice Amended) An oxygen-free plasma etching gas formulation for removing an organic ARC on a metallic layer comprising [one or more fluorine-containing compounds] CHF₃, [an optional inert carrier gas] argon and [chlorine] HCl or BCl₃, the gas formulation being free of SF₆.

18. (Twice Amended) [The oxygen-free plasma etching gas formulation of Claim 15, wherein a ratio of flow rates of CHF₃:argon:chlorine in the formulation is 5 to 80 sccm:5 to 80 sccm:5 to 60 sccm.] An oxygen-free plasma etching gas formulation for removing an organic ARC on a metallic layer comprising CHF₃, argon and chlorine, the gas formulation being free of SF₆, and a ratio of flow rates of CHF₃:argon:chlorine in the formulation is 5 to 80 sccm:5 to 80 sccm:5 to 60 sccm.

21. (Amended) [The oxygen-free plasma etching gas formulation of Claim 14, comprising more than one fluorine-containing compound.] An oxygen-free plasma etching gas formulation for removing an organic ARC on a metallic layer comprising more than one fluorine-containing compound, an optional inert carrier gas, and chlorine, the gas formulation being free of SF₆.